**The Distribution of Sample Proportions**

**E.g. Political Opinion Polls - National vs Labour.**

2 possible outcomes where ****** is the proportion of successful outcomes in ***n*** trials.

If a sequence of ***n*** independent trials results in ***x*** successes,

Then the number of successes, ***x***has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ distribution.

A point estimator of the population proportion of successful trials, ****,** is the *sample*

proportion *p*, where:

*p = Number of successes Written as*  *p =*

*Number of trials*

With a sufficient sample size (rule of thumb n**>**30), the distribution of sample proportions **p** is approximately normal and

The **standard deviation of the sample proportions** (i.e. how much they vary) is:

**P =

The **expected sample proportion** (i.e. the *mean* of the sample proportions) is:

**E(*P* )** = \_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_

By the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

Theorem.





Example: Political opinion polls.

500 New Zealanders aged 18 and over were selected at random for an opinion poll. They were asked to indicate whether Labour or National would be their preferred political party. 275 voted for National.

Find a **95% confidence interval** for the ***true* proportion of all voting-age NZers who favour National**.